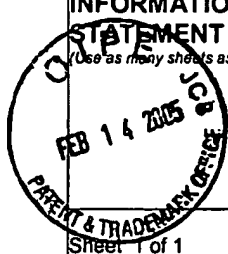


Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT

(Use as many sheets as necessary)



Sheet 1 of 1

Complete if Known

Application Number	09/945,535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Attorney Docket No: 1303.026US1

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Filing Date If Appropriate
Dsh	US-2002/0094632-A1	07/18/2002	Agarwal, V. K., et al.	01/15/2002
	US-2003/0124794-A1	07/03/2003	Girardie, Lionel	12/13/2002
	US-2003/0193061-A1	10/16/2003	Osten, Hans-Joerg	06/05/2003
	US-2003/0235961-A1	12/25/2003	Metzner, C., et al.	04/04/2003
	US-2004/0222476-A1	11/11/2004	Ahn, K. Y., et al.	06/09/2004
	US-2004/0262700-A1	12/30/2004	Ahn, K. Y., et al.	06/24/2003
	US-2005/0020017-A1	01/27/2005	Ahn, K. Y., et al.	06/24/2003
	US-5,745,334	04/28/1998	Hoffarth, Joseph G., et al.	03/25/1996
	US-5,912,797	06/15/1999	Schneemeyer, L. F., et al.	09/24/1997
	US-6,154,280	11/28/2000	Borden, P. G.	12/02/1998
	US-6,258,637	07/10/2001	Wilk, G. D., et al.	12/02/1999
	US-6,518,634	02/11/2003	Kaushik, V. S., et al.	09/01/2000
	US-6,674,138	01/06/2004	Halliyal, A., et al.	12/31/2001
	US-6,767,795	07/27/2004	Ahn, K.	01/17/2002
	US-6,821,862	11/23/2004	Cho, Hag-Ju	06/27/2001
	US-6,821,873	11/23/2004	Visokay, M. R., et al.	06/28/2002
	US-6,844,203	01/18/2005	Ahn, K. Y., et al.	08/30/2001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	T ²
Dsh	EP-0540993A1	05/12/1993	Argos, Jr., G., et al.	
	EP-1324376A1	07/02/2003	Girardie, L.	

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-Issue number(s), publisher, city and/or country where published.	T ²
Dsh		HOSHINO, Y., et al., "Characterization and Control of the HfO ₂ /Si(001) Interfaces", <u>Applied Physics Letters</u> , 81, (Sep. 30, 2002), 2650-2652	
		WOLF, S., et al., <u>Silicon Processing for the VLSI Era -- Vol. 4: Deep-Submicron Process Technology</u> , Lattice Press, Sunset Beach, CA, (2002), p. 98, 146, 173-174	

EXAMINER

Dsh

DATE CONSIDERED

3/7/05

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional) ² Applicant to place a check mark here if English language Translation is attached

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Attorney Docket No: 1303.026US1

Sheet 1 of 3

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
D52	US-2002/0089023	07/11/2002	Yu, Z. , et al.	257	411	01/05/2001
	US-2002/0155688	10/24/2002	Ahn, K. Y., et al.	438	592	04/20/2001
	US-2002/0155689	10/24/2002	Ahn, K. Y., et al.	29	76	02/11/2002
	US-2002/0192974	12/19/2002	Ahn, Kie , et al.	438	722	06/13/2001
	US-2003/0017717	01/23/2003	Ahn, Kie , et al.	438	768	07/18/2001
	US-4,215,156	07/29/1980	Dalal, H. , et al.	427	84	08/26/1977
	US-4,399,424	04/16/1983	Rigby, L. J.	338	34	10/05/1981
	US-5,822,256	10/13/1998	Bauer, Mark , et al.	365	200	03/05/1997
	US-5,828,080	10/27/1998	Yano, Y. , et al.	257	43	04/17/1995
	US-6,013,553	01/11/2000	Wallace, Robert , et al.	438	287	07/15/1998
	US-6,171,900	01/09/2001	Sun, Shi-Chung	438	240	04/15/1999
	US-6,225,168	05/01/2001	Gardner, Mark , et al.	438	287	06/04/1998
	US-6,297,539	10/02/2001	Ma, Y. , et al.	257	410	07/06/2000
	US-6,303,481	10/16/2001	Park, Dong	438	591	12/29/2000
	US-6,368,941	04/09/2002	Chen, Tai-Ju , et al.	438	424	11/08/2000
	US-6,465,334	10/15/2002	Buynoski, Matthew S., et al.	438	591	10/05/2000
	US-6,495,436	12/17/2002	Ahn, Kie , et al.	438	591	02/09/2001
↓	US-6,521,911	02/18/2003	Parsons, Gregory N., et al.	257	52	07/19/2001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T ²
D52	JP-2001-332546	11/30/2001		H01L	21/316	

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
D52		International Technology for Semiconductor Roadmap, (1999),	
↓		BRIGHT, A A., et al., "Low-rate plasma oxidation of Si in a dilute oxygen/helium plasma for low-temperature gate quality Si/SiO ₂ interfaces", <u>Applied Physics Letters</u> , (February 1991), pp. 619-621	

EXAMINER

DATE CONSIDERED

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.	
Complete if Known	
Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David
Attorney Docket No: 1303.026US1	

Sheet 2 of 3

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T*
DS		CHENG, BAOHONG, et al., "The Impact of High-k Gate Dielectrics and Metal Gate Electrodes on Sub-100nm MOSFET's", <u>IEEE Transactions on Electron Devices</u> , (1999), pp. 1537-1544	
		FUYUKI, TAKASHI, et al., "Initial stage of ultra-thin SiO2 formation at low temperatures using activated oxygen", <u>Applied Surface Science</u> , (1997), pp. 123-126	
		HIRAYAMA, MASAKI, et al., "Low-Temperature Growth of High-Integrity Silicon Oxide Films by Oxygen Radical Generated in High Density Krypton Plasma", <u>IEDM Technical Digest</u> , (1999), pp. 249-252	
		HUBBARD, K. J., et al., "Thermodynamic stability of binary oxides in contact with silicon", <u>J. Mater. Res.</u> , (11/1996), pp. 2757-2776	
		JEONG, CHANG-WOOK, et al., "Plasma-Assisted Atomic Layer Growth of High-Quality Aluminum Oxide Thin Films", <u>Japanese Journal of Applied Physics</u> , (January 2001), pp. 285-289	
		KAWAI, Y., et al., "Ultra-low-temperature growth of high-integrity gate oxide films by low-energy ion-assisted oxidation", <u>Applied Physics Letters</u> , (April 1994), pp. 2223-2225	
		KIM, C T., et al., "Application of Al2O3 Grown by Atomic Layer Deposition to DRAM and FeRAM", <u>International Symposium in Integrated Ferroelectrics</u> , (March 2000), pp. 316	
		KIM, Y., et al., "Substrate dependence on the optical properties of Al2O3 films grown by atomic layer deposition", <u>Applied Physics Letters</u> , (December 1997), pp. 3604-3606	
		LESKELA, M., et al., "ALD precursor chemistry: Evolution and future challenges", <u>Journal de Physique</u> , (1999), pp. 837-852	
		LIU, C. T., "Circuit Requirement and Integration Challenges of Thin Gate Dielectrics for Ultra Small MOSFETs", <u>IEDM</u> , (1998), pp. 747-750	
		LIU, Y C., et al., "Growth of ultrathin SiO2 on Si by surface irradiation with an O2+Ar electron cyclotron resonance microwave plasma at low temperatures", <u>Journal of Applied Physics</u> , (February 1999), pp. 1911-1915	
		MARTIN, P J., et al., "Ion-beam-assisted deposition of thin films", <u>Applied Optics</u> , (January 1983), pp. 178-184	
		MULLER, D. A., et al., "The electronic structure at the atomic scale of ultrathin gate oxides", <u>Nature</u> , vol.399, no.6738, 24 June 1999, (1999), pp. 758-61	
		NIEMINEN, MINNA, et al., "Formation and stability of lanthanum oxide thin films deposited from B-diketonate precursor", <u>Applied Surface Science</u> , (2001), pp. 155-165	
V		OSTEN, H. J., et al., "High-k Gate Dielectrics with Ultra-low Leakage Current Based on Praseodymium Oxide", <u>IEEE</u> , (2000), pp. 653-656	
		PAN, TUNG M., et al., "High Quality Ultrathin CoTiO3 High-k Gate Dielectrics", <u>Electrochemical and Solid-State Letters</u> , (2000), pp. 433-434	

EXAMINER

DS

DATE CONSIDERED

3/7/05

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 3 of 3

Attorney Docket No: 1303.026US1

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
<i>DS</i>		PAN, TUNG M., et al., "High-k cobalt-titanium oxide dielectrics formed by oxidation of sputtered Co/Ti or Ti/Co films", <u>Applied Physics Letters</u> , (March 2001), pp. 1439-1441	
		QI, WEN-JIE, et al., "MOSCAP and MOSFET characteristics using ZrO ₂ gate dielectric deposited directly on Si", <u>IEDM Technical Digest</u> , (1999), pp. 145-148	
		SAITO, YUJI, et al., "Advantage of Radical Oxidation for Improving Reliability of Ultra-Thin Gate Oxide", <u>2000 Symposium on VLSI Technology Digest of Technical Papers</u> , (2000), pp. 176-177	
		SAITO, YUJI, et al., "High-Integrity Silicon Oxide Grown at Low-Temperature by Atomic Oxygen Generated in High-Density Krypton Plasma", <u>Extended Abstracts of the 1999 International Conference on Solid State Devices and Materials</u> , (1999), pp. 152-153	
		SHIN, CHANG H., et al., "Fabrication and Characterization of MFISFET using Al ₂ O ₃ Insulating Layer for Non-Volatile Memory", <u>12th International Symposium in Integrated Ferroelectrics</u> , (March 2000), pp. 1-9	
		SZE, S M., <u>Physics of Semiconductor Devices</u> , (1981), p. 431	
		SZE, S M., <u>Physics of Semiconductor Devices</u> , (1981), p. 473	
		WOLF, STANLEY, et al., "Silicon Processing for the VLSI Era - Volume I: Process Technology", <u>Second Edition</u> , <u>Lattice Press</u> , Sunset Beach, California, (2000), page 443	

EXAMINER

DATE CONSIDERED

3/7/05

Substitute Disclosure Statement Form (PTO-1449)

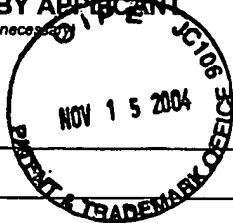
* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional) ² Applicant is to place a check mark here if English language Translation is attached

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)



Complete if Known

Application Number	09/945,535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 1 of 1

Attorney Docket No: 1303.026US1

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
AB	US-2004/0214399-A1	10/28/2004	Ahn, K. Y., et al.	
↓	US-6,586,349	07/01/2003	Jeon, J. S., et al.	
↓	US-6,740,605	05/25/2004	Shiraiwa, H., et al.	

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ²
--------------------	---------------------	------------------	---	---	----------------

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
--------------------	----------------------	---	----------------

EXAMINER

DATE CONSIDERED

2/2/05

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 1 of 1

Attorney Docket No: 1303.026US1

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
	US-2001/0009695	07/26/2001	Saanila, Ville A., et al.	427	255.39	01/18/2001
	US-2002/0146916	10/10/2002	Irino, Kiyoshi, et al.	438	785	03/29/2002
	US-2003/0175411	09/18/2003	Kodas, T. T., et al.	427	58	10/04/2002
	US-6,093,944	07/25/2003	VanDover, R B.	257	310	06/04/1998
	US-6,451,695	09/17/2002	Sneh, O.	438	685	12/22/2000
	US-6,602,338	08/05/2003	Chen, S., et al.	106	287.19	04/11/2001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T ²
--------------------	---------------------	------------------	---	-------	----------	----------------

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		CHAMBERS, J J., et al., "Physical and electrical characterization of ultrathin yttrium silicate insulators on silicon", <u>Journal of Applied Physics</u> , 90(2), (July 15, 2001), 918-33	
		KUKLI, KAUPOL, et al., "Low-Temperature Deposition of Zirconium Oxide-Based Nanocrystalline Films by Alternate Supply of Zr[OC(CH ₃) ₃] ₄ and H ₂ O", <u>Chemical Vapor Deposition</u> , 6(6), (2000), 297-302	
		NAKAJIMA/ANRI, "Soft breakdown free atomic-layer-deposited silicon-nitride/SiO ₂ /stack gate dielectrics", <u>International Electron Devices Meeting. Technical Digest</u> , (2001), 6.5.1-4	
		RAHTU/ANTTI, et al., "Atomic Layer Deposition of Zirconium Titanium Oxide from Titanium Isopropoxide and Zirconium Chloride", <u>Chemistry of Materials</u> , 13(5) (May 2001), 1528-1532	
		WOLF, S., et al., <u>In: Silicon Processing of the VLSI Era, Vol. 1</u> , Lattice Press, 374-380	

*Previously Considered***EXAMINER****DATE CONSIDERED**

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945,535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 1 of 4

Attorney Docket No: 1303.026US1

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
DS	US-2001/0002280	05/31/2001	Sneh, Ofer	427	255.28	12/22/2000
	US-2001/0042505	11/22/2001	Vaartstra, Brian A.	117	104	07/18/2001
	US-2002/0192974	12/19/2002	Ahn, Kie Y., et al.	438	722	06/13/2001
	US-2002/0001971	01/03/2002	Cho, Hag-ju	438	765	06/27/2001
	US-2002/0086507A1	07/04/2002	Park, Dae G., et al.	438	585	12/26/2001
	US-2002/0111001	08/15/2002	Ahn, Kie Y., et al.	438	592	02/09/2001
	US-2003/0001212	01/02/2003	Hu, Yongjun, et al.	257	388	08/29/2002
	US-2003/0003702	01/02/2003	Ahn, Kie Y., et al.	438	591	08/26/2002
	US-2003/0003722	01/02/2003	Vaartstra, Brian A.	438	656	08/19/2002
	US-2003/0042526	03/06/2003	Weimer, Ronald A.	257	309	08/29/2001
	US-2003/0052356	03/20/2003	Yang, Haining, et al.	257	309	10/11/2002
	US-2003/0052358	03/20/2003	Weimer, Ronald A.	257	310	10/25/2002
	US-2003/0102501	06/05/2003	Yang, Haining, et al.	257	295	12/12/2002
	US-2003/0119313	06/26/2003	Yang, Haining, et al.	438	681	12/05/2002
	US-2003/0157764	08/21/2003	Ahn, Kie Y., et al.	438	212	02/20/2002
	US-2003/0207593A1	11/06/2003	Derderian, G. J., et al.	438	778	05/02/2002
	US-2003/0222300	12/04/2003	Basceri, Cem, et al.	257	309	03/13/2003
	US-2003/0224600A1	12/04/2003	Cao, W., et al.	438	684	03/04/2003
	US-2003/0228747	12/11/2003	Ahn, Kie Y., et al.	438	591	06/05/2002
	US-2003/0232511A1	12/18/2003	Metzner, C. R., et al.	438	785	09/19/2002
	US-2004/0033681	02/19/2004	Ahn, Kie Y., et al.	438	591	08/15/2002
	US-2004/0033701A1	02/19/2004	Ahn, K. Y., et al.	438	785	08/15/2002
	US-2004/0038525A1	02/26/2004	Meng, S., et al.	438	656	08/26/2002
	US-2004/0043557 A1	03/04/2004	Haukka et al.	438	240	09/02/2003
	US-2004/0065255A1	04/08/2004	Yang, M. X., et al.	118	715	01/31/2003
	US-2004/0087124A1	05/06/2004	Kubota, M., et al.	438	591	09/16/2003
	US-2004/0099889A1	05/27/2004	Frank, M. M., et al.	257	288	11/27/2002
	US-4,058,430	11/15/1977	Suntola, T., et al.	427	255.13	11/25/1975
	US-5,302,461	04/12/1994	Anthony, T. C.	428	472	06/05/1992
	US-5,625,233	04/29/1997	Cabral, Jr., C., et al.	257	771	01/13/1995
	US-5,789,030	08/04/1998	Rolfson, J B.	429	309	03/18/1996
	US-6,010,969	01/04/2000	Vaarstra, Brian A.	438	758	10/02/1996
	US-6,025,627	02/15/2000	Forbes, Leonard, et al.	257	321	05/29/1998
	US-6,040,243	03/21/2000	Li, J., et al.	438	687	09/20/1999
	US-6,120,531	09/19/2000	Zhou, Lin, et al.	607	111	10/17/1997
	US-6,187,484	02/13/2001	Glass, Thomas R., et al.	430	5	08/31/1999
	US-6,203,726	03/20/2001	Danielson, Earl, et al.	252	301	10/07/1999
	US-6,217,645	04/17/2001	Vaartstra, Brian A.	106	287.18	09/02/1999
	US-6,225,237	05/01/2001	Vaartstra, Brian A.	438	778	09/01/1998
	US-6,273,951	08/14/2001	Vaartstra, Brian A.	117	104	06/16/1999

EXAMINER

DATE CONSIDERED

3/2/05

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945,535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 2 of 4

Attorney Docket No: 1303.026US1

62	US-6,294,813	09/25/2001	Forbes, Leonard , et al.	257	321	02/15/2000
	US-6,300,203	10/09/2001	Buynoski, M. S., et al.	438	287	10/05/2000
	US-6,331,465	12/18/2001	Forbes, Leonard , et al.	438	260	02/15/2000
	US-6,368,398	04/09/2002	Vaartstra, Brian A.	106	28718	01/19/2001
	US-6,368,518	04/09/2002	Vaartstra, Brian A.	216	67	08/25/1999
	US-6,451,641	09/17/2002	Halliyal, Arvind , et al.	438	200	02/27/2002
	US-6,451,662	09/17/2002	Chudzik, M. , et al.	438	386	10/04/2001
	US-6,455,717	09/24/2002	Vaartstra, Brian A.	556	1	08/28/2000
	US-6,461,914	10/08/2002	Roberts, D. R., et al.	438	253	08/29/2001
	US-6,498,063	12/24/2002	Ping, Er-Xuan	438	253	10/12/2001
	US-6,518,610	02/11/2003	Yang, Haining , et al.	257	295	02/20/2001
	US-6,524,867	02/25/2003	Yang, Haining , et al.	438	3	12/28/2000
	US-6,524,901	02/25/2003	Trivedi, Jigish D.	438	183	06/20/2002
	US-6,527,866	03/04/2003	Matijasevic, Vladimir , et al.	118	719	02/09/2000
	US-6,531,354	03/11/2003	Maria, J. , et al.	438	216	01/17/2001
	US-6,537,613	03/25/2003	Senzaki, Y. , et al.	427	250	04/10/2000
	US-6,544,875	04/08/2003	Wilk, Glen D.	438	591	01/07/2000
	US-6,573,199	06/03/2003	Sandhu, Gurtej S., et al.	438	798	08/30/2001
	US-6,586,792	07/01/2003	Ahn, Kie Y., et al.	257	295	03/15/2001
	US-6,593,610	07/15/2003	Gonzalez, Fernando	257	296	12/13/2001
	US-6,608,378	08/19/2003	Ahn, Kie Y., et al.	257	701	08/26/2002
	US-6,613,702	09/02/2003	Sandhu, Gurtej S., et al.	438	798	01/17/2003
	US-6,620,670	09/16/2003	Song, K. , et al.	438	216	01/18/2002
	US-6,627,503	09/30/2003	Ma, Y. , et al.	438	287	04/30/2002
	US-6,639,267	10/28/2003	Eldridge, Jerome M.	257	310	07/29/2002
	US-6,645,882	11/11/2003	Halliyal, Arvind , et al.	438	785	01/17/2002
	US-6,660,660	12/09/2003	Haukka, S. P., et al.	438	778	08/31/2001
	US-6,661,058	12/09/2003	Ahn, Kie Y., et al.	257	344	02/11/2002
	US-6,682,602	01/27/2004	Vaartstra, Brian A.	118	715	08/19/2002
	US-6,683,005	01/27/2004	Sandhu, Gurtej S., et al.	438	715	01/17/2003
	US-6,683,011	01/27/2002	Smith, Ryan et al.	438	785	11/14/2001
	US-6,696,332	02/24/2004	Visokay, M. R., et al.	438	216	06/21/2002
	US-6,699,745	03/02/2004	Banerjee, Aditi et al.	438	238	03/27/1998
	US-6,713,846	03/30/2004	Senzaki, Y.	257	635	01/25/2002
	US-6,730,575	05/04/2004	Eldridge, Jerome M.	257	310	08/30/2001
	US-6,750,066	06/15/2004	Cheung, F. T., et al.	438	3	04/08/2002
✓	US-6,762,114	07/13/2004	Chambers, J. J.	438	591	12/31/2002

EXAMINER

P51

DATE CONSIDERED

3/7/05

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945,535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 3 of 4

Attorney Docket No: 1303.026US1

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
059		Copy of PCT Search Report dated 10/15/2003 for application PCT/US 03/17730 completed by S. Nesso.	
		"Improved Metallurgy for Wiring Very Large Scale Integrated Circuits", International Technology Disclosures, 4, Abstract, (1986), 1 page	
		BRAUD, F., "Ultra Thin Diffusion Barriers for Cu Interconnections at The Gigabit Generation and Beyond", VMIC Conference Proceedings, (1996), 174- 179	
		CALLEGARI, A., et al., "Physical and electrical characterization of Hafnium oxide and Hafnium silicate sputtered films", Journal of Applied Physics, 90(12), (December 15, 2001), 6466-75	
		CHANG, HYO S., et al., "Excellent thermal stability of Al ₂ O ₃ /ZrO ₂ /Al ₂ O ₃ stack structure of metal-oxide-semiconductor gate dielectrics application", Applied Physics Letters, 80(18), (May 6, 2002), 3385-7	
		CHEN, P. J., et al., "Thermal stability and scalability of Zr-aluminate-based high- k gate stacks", Symposium on VLSI Technology Digest, (2002), 192-3	
		CLARK, P., "IMEC Highlights Hafnium, Metal Gates for High-k Integration", Semiconductor Business News, at Silicon Strategies.com, (10/11/02), 2 pages	
		COLOMBO, D., et al., "Anhydrous Metal Nitrates as Volatile Single Source Precursors for the CVD of Metal Oxide Films", Communications, Department of EE, U of M, Mpls, MN, (7/7/98), 3 pages	
		CONLEY JR., J F., et al., "Atomic Layer Deposition of Hafnium Oxide Using Anhydrous Hafnium Nitrate", Electrochemical and Solid State Letters, 5(5), (2002), C57-C59	
		DA ROSA, E B., et al., "Annealing of ZrAl/sub x/O/sub y/ ultrathin films on Si in a vacuum or in O/sub 2/", Journal of the Electrochemical Society, 148 (12), (December 2001), G695-G703	
		DING, "Copper Barrier, Seed Layer and Planarization Technologies", VMIC Conference Proceedings, (1997), 87-92	
		FUKUMOTO, HIROFUMI, et al., "Heteroepitaxial growth of Y ₂ O ₃ films on silicon", Applied Physics Letters, 55(4), (July 24, 1989), 360-361	
		FUYUKI, TAKASHI, et al., "Electronic Properties of the Interface between Si and TiO ₂ Deposited at Very Low Temperatures", Japanese Journal of Applied Physics, 25(9), (September 1986), 1288-1291	
		GUO, XIN, et al., "High quality ultra-thin (1.5 nm) TiO ₂ -Si ₃ N ₄ gate dielectric for deep sub-micron CMOS technology", IEDM Technical Digest, International Electron Devices Meeting, Cited in related application, (December 5-8, 1999), 137-140	
		IJIMA, T., "Microstructure and Electrical Properties of Amorphous W-Si-N Barrier Layer for Cu Interconnections", 1996 VMIC Conference, (1996), 168-173	

EXAMINER

DATE CONSIDERED

3/1/05

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 606. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945,535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 4 of 4

Attorney Docket No: 1303.026US1

159	JEON, SANGHUN, et al., "Ultrathin nitrided-nanolaminate (Al ₂ O ₃ /ZrO ₂ /Al ₂ O ₃) for metal/oxide/semiconductor gate dielectric applications", <u>Journal of Vacuum Science & Technology B: Microelectronics and Nanometer Structures</u> , 20(3), (May 2002), 1143-5	
	KWO, J., et al., "High gate dielectrics Gd ₂ O ₃ and Y ₂ O ₃ for silicon", <u>Applied Physics Letters</u> , 77(1), (July 3, 2000), 130-132	
	KWO, J., "Properties of high k gate dielectrics Gd ₂ O ₃ and Y ₂ O ₃ for Si", <u>Journal of Applied Physics</u> , 89(7), (2001), 3920-3927	
	LAURSEN, T., "Encapsulation of Copper by Nitridation of Cu-Ti Alloy/Bilayer Structures", <u>International Conference on Metallurgical Coatings and Thin Films</u> , Abstract No. H1.03, San Diego, CA, (April 1997), 309	
	LEE, S. J., et al., "Hafnium oxide gate stack prepared by in situ rapid thermal chemical vapor deposition process for advanced gate dielectrics", <u>Journal of Applied Physics</u> , 92 (5), (September 1, 2002), 2807-09	
	LEE, CHENG-CHUNG, et al., "Ion-assisted deposition of silver films", <u>Thin Solid Films</u> , vol. 359, (2000), 95-97	
	LEE, et al., "Ultrathin Hafnium Oxide with Low Leakage and excellent Reliability for Alternative Gate Dielectric Application", <u>IEEE Technical Digest of International Electron Devices Meeting 1999</u> , (1999), 133-136	
	LUAN, et al., "High Quality Ta ₂ O ₅ Gate Dielectrics and T[...]", <u>IEEE Technical Digest of Int. Elec. Devices Mtng 1999</u> , (1999), 141-142	
	MARTIN, et al., "Ion-beam-assisted deposition of thin films", <u>Applied Optics</u> , 22(1), (1983), 178-184	
	NONE IDENTIFIED, "Improved Metallurgy for Wiring Very Large Scale Integrated Circuits", <u>International Technology Disclosures</u> , vol. 4, no. 9, (1986), page 2	
	Ohmi, S, et al, "Rare Earth Metal Oxides for High-K Gate Insulator", <u>Semiconductor Silicon 2002</u> , Vol. 1, Electrochemical Society Proceedings 2002-2, Pg. 376-387.	
	RYU, CHANGSUP, "Barriers for Copper Interconnections", <u>Solid State Technology</u> , 42(4), (April 1999), pages 1-3	
	SMITH, RYAN C., et al., "Chemical Vapour Deposition of the Oxides of Titanium, Zirconium and Hafnium for Use as High-k Materials in Microelectronic Devices. A Carbon-free Precursor for the Synthesis of Hafnium Dioxide", <u>Advanced Materials for Optics and Electronics</u> , 10(3-5), (June 29, 2000), 105-14	
	SOUCHE, D., et al., "Visible and infrared ellipsometry study of ion assisted SiO ₂ films", <u>Thin Solid Films</u> , 313-314, (1998), 676-681	
	STATHIS, J. H., et al., "Reliability Projection for Ultra-Thin Oxides at Low Voltage", <u>Tech. Dig. International Electron Device Meeting</u> , (1998), 167-9	
✓	YAMAMOTO, K., et al., "Effect of Hf metal predeposition on the properties of sputtered HfO ₂ /Hf stacked gate dielectrics", <u>Applied Physics Letters</u> , 81(11), (September 9, 2002), 2053-5	

EXAMINER

DATE CONSIDERED

8/2/05

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 1 of 8

Attorney Docket No: 1303.026US1

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
DS	US20010051442A1	12/13/2001	Katsir, D., et al.	438	758	06/28/2001
	US20010053082A1	12/20/2001	Chipalkatti, M. H., et al.	362	496	12/22/1999
	US20020022156A1	02/21/2002	Bright, C. I.	428	698	08/24/2001
	US20020119297	08/29/2002	Forrest, S. R., et al.	428	199	12/21/2001
	US20030001241A1	01/02/2003	Chakrabarti, U. K., et al.	257	643	05/28/2002
	US-3,381,114	04/30/1968	Nakanuma, Sho	219	385	12/18/1964
	US-4,394,673	07/19/1983	Thompson, R. D., et al.	357	15	09/29/1980
	US-4,413,022	11/01/1983	Suntola, T., et al.	427	255.2	06/21/1979
	US-4,590,042	05/20/1986	Drage, David J.	422	186.06	12/24/1984
	US-4,767,641	08/30/1988	Kieser, Jorg, et al.	427	38	07/03/1986
	US-4,993,358	02/19/1991	Mahawili, Imad	118	715	07/28/1989
	US-5,006,192	04/09/1991	Deguchi, Mikio	156	345	11/21/1988
	US-5,055,319	10/08/1991	Bunshah, R. F., et al.	427	38	04/02/1990
	US-5,080,928	01/14/1992	Klinedinst, K. A., et al.	427	70	10/05/1990
	US-5,198,029	03/30/1993	Dutta, A., et al.	118	303	02/19/1992
	US-5,595,606	01/21/1997	Fujikawa, Y., et al.	118	725	04/18/1996
	US-5,621,681	04/15/1997	Moon, J	365	145	03/22/1996
	US-5,698,022	12/16/1997	Glassman, T. E., et al.			08/14/1996
	US-5,735,960	04/07/1998	Sandhu, Gurtej S., et al.	118	723 IR	04/02/1996
	US-5,744,374	04/28/1998	Moon, Jong	437	60	11/18/1996
	US-5,840,897	11/24/1998	Kirlin, Peter, et al.	546	2	06/07/1995
	US-5,916,365	01/29/1999	Sherman, A.	117	92	08/16/1996
	US-5,950,925	09/14/1999	Fukunaga, Yukio, et al.	239	132.3	10/10/1997
	US-5,972,847	10/26/1999	Feenstra, R., et al.	505	473	01/28/1998
	US-6,057,271	05/02/2000	Kenjiro, H., et al.	505	475	06/07/1995
	US-6,059,885	05/09/2000	Ohashi, Tadashi, et al.	118	730	12/16/1997
	US-6,110,529	08/29/2000	Gardiner, R., et al.	427	250	06/07/1995
	US-6,161,500	12/19/2000	Kopacz, Stanislaw, et al.	118	723 E	09/30/1997
	US-6,203,613	03/20/2001	Gates, S., et al.	117	104	10/19/1999
	US-6,206,972	03/27/2001	Dunham, Scott W.	118	715	07/08/1999
	US-6,232,847	05/15/2001	Marcy, 5th, H. O., et al.	331	167	05/28/1998
	US-6,281,144	08/28/2001	Cleary, Thomas J., et al.	438	780	07/15/1999
	US-6,291,866	09/18/2001	Wallace, R. M., et al.	257	410	10/20/1999
	US-6,297,516	10/02/2001	Forrest, S. R., et al.	257	40	06/25/1999
	US-6,302,964	10/16/2001	Umotoy, Salvador P., et al.	118	715	03/16/2000
	US-6,348,386	02/19/2002	Gilmer, D C.	438	288	04/16/2001
	US-6,380,579	04/30/2002	Nam, S., et al.	257	306	04/11/2000
	US-6,391,769	05/21/2002	Lee, J., et al.	438	643	03/14/2000
	US-6,420,279	07/16/2002	Ono, Yoshi, et al.	438	785	06/28/2001
	US-6,432,779	08/13/2002	Hobbs, C., et al.	438	287	01/30/2001

EXAMINER

DATE CONSIDERED

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 2 of 8

Attorney Docket No: 1303.026US1

DS	US-6,444,039	09/03/2002	Nguyen, Tue	118	715	03/07/2000
	US-6,444,895	09/03/2002	Nikawa, K.	136	212	09/24/1999
	US-6,445,023	09/03/2002	Vaartstra, Brian, et al.	257	295	03/16/1999
	US-6,448,192	09/10/2002	Kaushik, Vidya S.	438	785	04/16/2001
	US-6,458,701	10/01/2002	Chae, Y., et al.	438	680	10/12/2000
	US-6,482,740	11/19/2002	Soininen, Pekka J., et al.	438	686	05/15/2001
	US-6,514,828	02/04/2003	Ahn, Kie Y., et al.	438	297	04/20/2001
	US-6,534,420	03/18/2003	Ahn, Kie Y., et al.	438	768	07/18/2001

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T ²
DS	JP-5090169	04/09/1993	Watanabe, Kunihiro, et al.			
	JP-62-199019	09/02/1987	Takaaki, Sasaki			

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
DS		AARIK, J, et al., Thin Solid Films, 340, (1999), 110-116	
		AARIK, JAAN, et al., "Atomic layer growth of epitaxial TiO/sub 2/ thin films from TiCl/sub 4/ and H/sub 2/O on alpha -Al/sub 2/O/sub 3/ substrates", Journal of Crystal Growth, vol.242, no.1-2, (2002), 189-198	
		AARIK, JAAN, et al., "Phase transformations in hafnium dioxide thin films grown by atomic layer deposition at high temperatures", Applied Surface Science, 173, (2001), 15-21	
		AARIK, JAAN, et al., "Texture Development in nanocrystalline hafnium dioxide thin films grown by atomic layer deposition", Journal of Crystal Growth, 220, (2000), 105-113	
		ALLEN, PETRA, et al., "Atomic Layer deposition of Ta(Al)N(C) thin films using trimethylaluminum as a reducing agent", Journal of the Electrochemical Society, vol.148, no.10, (October 2001), G566-G571	
		BENDORAITIS, J G., et al., Jour. Phys. Chem., 69(10), (1965), 3666-3667	
		BUNSHAH, ROINTAN F., et al., "Deposition Technologies for Films and Coatings: Developments and Applications", Noyes Publications, 102-103	
		CAVA, R J., et al., "Improvement of the dielectric properties of Ta/sub 2/O/sub 5/ through substitution with Al/sub 2/O/sub 3/", Applied Physics Letters, vol.70, no.11, (March 1997), 1396-8	
		COPEL, M., et al., "Structure and stability of ultrathin zirconium oxide layers on Si(001)", Applied Physics Letters, Vol 76, No. 4, (January 2000), 436-438	
		DE FLAVIIS, FRANCO, et al., "Planar microwave integrated phase-shifter design with high purity ferroelectric material", IEEE Transactions on Microwave Theory & Techniques, vol.45, no.6, (June 1997), 963-969	
		DESU, S.B., "Minimization of Fatigue in Ferroelectric Films", Phys. Stat. Sol. (a) 151, (1995), 467-480	

EXAMINER

DATE CONSIDERED

3/7/05

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 3 of 8

Attorney Docket No: 1303.026US1

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
<i>DBT</i>		DUSCO, C , et al., "Deposition of tin oxide into porous silicon by atomic layer epitaxy", <u>J. Electrochem. Soc.</u> , 143, (1996),683-687	
		EL-KAREH, B , et al., "The evolution of DRAM cell technology", <u>Solid State Technology</u> , (1997),89	
		ENGELHARDT, M. , "Modern Applications of Plasma Etching and Patterning in Silicon Process Technology", <u>Contrib. Plasma. Phys.</u> , 39(5), (1999),473-478	
		FORSGREN, K , <u>Comprehensive Summaries of Uppsala Dissertation from the Faculty of Science and Technology</u> , 665, (2001),37	
		FORSGREN, KATARINA , et al., "Atomic Layer Deposition of HfO ₂ using hafnium iodide", <u>Conference held in Monterey, California, (May 2001)</u> ,1 page	
		FUYUKI, TAKASHI , et al., "Electronic Properties of the Interface between Si and TiO ₂ Deposited at Very Low Temperatures", <u>Journal of Applied Physics</u> , (1986),1288-1291	
		GARTNER, M , et al., "Spectroellipsometric characterization of lanthanide-doped TiO ₂ films obtained via the sol-gel technique", <u>Thin Solid Films</u> , (1993),561-565	
		GELLER, S. , et al., "Crystallographic Studies of Perovskite-like Compounds. II. Rare Earth Aluminates", <u>Acta Cryst. Vol. 9</u> , (May 1956),1019-1025	
		GIESS, E. A., et al., "Lanthanide gallate perovskite-type substrates for epitaxial, high-Tc superconducting Ba ₂ YCu ₃ O ₇ - films", <u>IBM J. Res. Develop. vol. 34, No. 6</u> , (November 1990),916-926	
		GUILLAMOT, B , et al., <u>Technical Digest of International Electron Devices Meeting 2002</u> , (2002),355-358	
		GUSEV, E P., et al., "Ultrathin High-K Dielectrics Grown by Atomic Layer Deposition: A Comparative Study of ZrO ₂ , HfO ₂ , Y ₂ O ₃ and Al ₂ O ₃ ", <u>Electrochemical Society Proceedings Volume 2001-9</u> , (2001),189-195	
		GUTOWSKI, M J., <u>J. Appl. Phys.</u> , 80, (2002),1897-1899	
		HUNT, C. E., et al., "Direct bonding of micromachined silicon wafers for laser diode heat exchanger applications", <u>J. Micromech. Microeng.</u> , 1, (1991),152-156	
		IDDLES, D M., et al., "Relationships between dopants, microstructure and the microwave dielectric properties of ZrO ₂ -TiO ₂ -SnO ₂ ceramics", <u>Journal of Materials Science, Vol. 27</u> , (1992),6303-6310	
		JEON, SANGHUN , et al., "Excellent Electrical Characteristics of Lanthanide (Pr, Nd, Sm, Gd, and Dy) Oxide and Lanthanide-doped Oxide for MOS Gate Dielectric Applications", <u>Technical Digest of IEDM</u> , (2001),471-474	
		JUNG, H S., et al., <u>Technical Digest of International Electron Devices Meeting 2002</u> , (2002),853-856	
		KANG, L , et al., <u>Tech. Dig. Int. Electron Devices Meet.</u> , 2000, (2000),35	
		KEOMANY, D. , et al., "Sol gel preparation of mixed cerium-titanium oxide thin films", <u>Sol. Energy Mater. So. Cells</u> , 33,(1994),pp. 429-441	
<i>n</i>		KIM, Y W., et al., <u>Technical Digest of International Electron Devices Meeting 2002</u> , (2002),69-72	

EXAMINER

DATE CONSIDERED

8/7/05

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 808. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. † Applicant's unique citation designation number (optional) ‡ Applicant is to place a check mark here if English language Translation is attached

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 4 of 8

Attorney Docket No: 1303.026US1

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
DSP		KIM, D. , et al., "Atomic Control of Substrate Termination and Heteroepitaxial Growth of SrTiO ₃ /LaAlO ₃ Films", <u>Journal of the Korean Physical Society Vol. 36 No.6, (06/2000),444-448</u>	
		KIM, BYOUNG-YOUP , et al., "Comparison study for TiN films deposited from different method: chemical vapor deposition and atomic layer deposition", <u>Mechanisms of Surface and Microstructure Evolution in Deposited Films and Film Structures Symposium (Materials Research Society Symposium Proceedings Vol.672), (2001),7.8.1-7.8.6</u>	
		KIM, TAESEOK , et al., "Correlation between strain and dielectric properties in ZrTiO/sub 4/ thin films", <u>Applied Physics Letters, vol.76, no.21, (May 2000),3043-3045</u>	
		KIM, TAESEOK , et al., "Dielectric properties and strain analysis in paraelectric ZrTiO/sub 4/ thin films deposited by DC magnetron sputtering", <u>Japanese Journal of Applied Physics Part 1-Regular Papers Short Notes & Review Papers, vol.39, no.7A, (2000),4153-4157</u>	
		KIM, YONGJO , et al., "Effect of microstructures on the microwave dielectric properties of ZrTiO/sub 4/ thin films", <u>Applied Physics Letters, vol.78, no.16, (April 2001),2363-2365</u>	
		KRAUTER, G. , et al., "Room Temperature Silicon Wafer Bonding with Ultra-Thin Polymer Films", <u>Advanced Materials, 9(5), (1997),417-420</u>	
		KUKLI, K J., et al., <u>J. Appl. Phys., 80, (2002),5698-5703</u>	
		KUKLI, K , et al., <u>Thin Solid Films, 416, (2002),72-79</u>	
		KUKLI, KAUP0 , et al., "Atomic Layer Deposition of Titanium Oxide TiO ₂ and H ₂ O ₂ ", <u>Chem. Vap. Deposition, Vol. 6, No. 6, (2000),303-310</u>	
		KUKLI, K , et al., "Controlled Growth of Yttrium Oxysulphide Thin Films by Atomic Layer Deposition", <u>Materials Science Forum, (1999),216-221</u>	
		KUKLI, KAUP0 , et al., "Dielectric Properties of Zirconium Oxide Grown by Atomic Layer Deposition from Iodide Precursor", <u>Journal of The Electrochemical Society, 148(12), (2001),F227-F232</u>	
		KUKLI, K , et al., "Influence of thickness and growth temperature on the properties of zirconium oxide films growth by atomic layer deposition on silicon", <u>Thin Solid Films, 410, (2002),53-60</u>	
		LEE, B H., et al., <u>Tech. Dig. Int. Electron Devices Meet., 2000, (2000),39</u>	
		LEE, S J., et al., <u>Tech. Dig. Int. Electron Devices Meet., 2000, (2000),31</u>	
		LEE, J H., et al., <u>Technical Digest of International Electron Devices Meeting 2002, (2002),221-224</u>	
		LEE, A E., et al., "Epitaxially grown sputtered LaAlO ₃ films", <u>Appl. Phys. Lett. 57 (19), (November 1990),2019-2021</u>	
✓		LEE, CHENG-CHUNG , et al., "Ion-assisted deposition of silver thin films", <u>Thin Solid Films, 359,(2000),pp. 95-97</u>	

EXAMINER

DATE CONSIDERED

3/7/05

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
 STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 5 of 8

Attorney Docket No: 1303.026US1

130	LEE, DONG H., et al., "Metalorganic chemical vapor deposition of TiO ₂ :n anatase thin film on Si substrate", <u>Applied Physics Letters</u> , (February 1995), pp. 815-816	
	LEE, L P., et al., "Monolithic 77 K dc SQUID magnetometer", <u>Appl. Phys. Lett.</u> 59(23), (December 1991), 3051-3053	
	LEE, C. H., et al., "MOS Characteristics of Ultra Thin Rapid Thermal CVD ZrO ₂ and Zr Silicate Gate Dielectrics", <u>IEDM</u> , (2000), pp. 27-30	
	LEE, C H., et al., "MOS Devices with High Quality Ultra Thin CVD ZrO ₂ Gate Dielectrics and Self-Aligned TaN and TaN/Poly-Si Gate electrodes", <u>2001 Symposium on VLSI, Technology Digest of Technical Papers</u> , (2001), 137-138	
	LEE, BYOUNG H., et al., "Ultrathin Hafnium Oxide with Low Leakage and Excellent Reliability for Alternative Gate Dielectric Application", <u>Technical Digest of IEDM</u> , (1999), 133-136	
	LUCOVSKY, G , et al., "Microscopic model for enhanced dielectric constants in low concentration SiO ₂ -rich noncrystalline Zr and Hf silicate alloys", <u>Applied Physics Letters</u> , (October 2000), 2912-2914	
	LUO, Z J., et al., "Ultra-thin ZrO ₂ (or Silicate) with High Thermal Stability for CMOS Gate Applications", <u>2001 Symposium on VLSI Technology Digest of Technical Papers</u> , (2001), 135-136	
	MOLODYK, A A., et al., "Volatile Surfactant-Assisted MOCVD: Application to LaAlO ₃ Thin Film Growth", <u>Chem. Vap. Deposition Vol. 6, No. 3</u> , (2000), 133-138	
	MOLSA, HEINI , et al., "Growth of Yttrium Oxide Thin Films from B-Diketonate Precursor", <u>Advanced Materials for Optics and Electronics</u> , (1994), 389-400	
	NAKAGAWARA, OSAMU , et al., "Electrical properties of (Zr, Sn)TiO ₄ dielectric thin film prepared by pulsed laser deposition", <u>J. Appl. Phys.</u> , 80(1), (July 1996), 388-392	
	NAKAJIMA, ANRI , et al., "Atomic-layer deposition of ZrO ₂ /sub 2/ with a Si nitride barrier layer", <u>Applied Physics Letters</u> , vol.81, no.15, (October 2002), 2824-2826	
	NAKAJIMA, ANRI , et al., "NH ₃ -annealed atomic-layer-deposited silicon nitride as a high-k gate dielectric with high reliability", <u>Applied Physics Letters</u> , (February 2002), 1252-1254	
	NEUMAYER, D A., et al., "Materials characterization of ZrO ₂ -SiO ₂ and HfO ₂ -SiO ₂ binary oxides deposited by chemical solution deposition", <u>Journal of Applied Physics</u> , (August 2001), 1801-1808	
	NIILISK, A , et al., "Atomic-scale optical monitoring of the initial growth of TiO ₂ thin films", <u>Int. Soc. Opt. Eng.</u> , 431, (2001), 72-77	
	OATES, D E., et al., "Surface impedance measurements of YBa/sub 2/Cu/sub 3O/sub 7-x/ thin films in stripline resonators", <u>IEEE Transactions on Magnetics</u> , vol.27, no.2, pt.2, (March 1991), 867-871	
	OH, C B., et al., <u>Technical Digest of International Electron Devices Meeting 2002</u> , (2002), 423-426	
	PARK, J J., et al., <u>J. of the Electrochemical Soc.</u> , 149, (2002), G89-G94	

EXAMINER

DS

DATE CONSIDERED

3/7/05

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 6 of 8

Attorney Docket No: 1303.026US1

BS		PARK, BYUNG-EUN , et al., "Electrical properties of LaAlO ₃ /Si and Sr _{0.8} Bi _{2.2} Ta ₂ O ₉ /LaAlO ₃ /Si structures", <u>Applied Physics Letters</u> , Vol. 79, No. 6, (August 2001),806-808	
		PERKINS, CHARLES M., et al., "Electrical and materials properties of ZrO ₂ gate dielectrics grown by atomic layer chemical vapor deposition", <u>Applied Physics Letters</u> , Vol. 78, No. 16, (April 2001),2357-2359	
		POVESHCHENKO, V P., et al., <u>Sov. J. Opt. Technol.</u> , 51, (1984),277-279	
		QI, WEN-JIE , et al., "Performance of MOSFETs with ultra thin ZrO ₂ and Zr-silicate gate dielectrics", <u>2000 Symposium on VLSI Technology, Digest of Technical Papers</u> , (2000),40-41	
		RAMAKRISHNAN, E S., et al., "Dielectric Properties of Radio Frequency Magnetron Sputter Deposited Zirconium Titanate-Based Thin Films", <u>J. Electrochem. Soc.</u> , Vol. 145, No. 1, (January 1998),358-362	
		RAYNER JR., G , et al., "The Structure of Plasma-Deposited and Annealed Pseudo-Binary ZrO ₂ -SiO ₂ Alloys", <u>Material Res. Soc. Symp.</u> , (2000),C1.3.1-C1.3.9	
		RITALA, MIKKO , "Atomic Layer Epitaxy Growth of Titanium, Zirconium and Hafnium Dioxide Thin Films", <u>Annales Academiae Scientiarum Fennicae</u> , (1994),24-25	
		RITALA, MIKKO , et al., "Zirconium dioxide thin films deposited by ALE using zirconium tetrachloride as precursor", <u>Applied Surface Science</u> , Vol. 75, (1994),333-340	
		ROBERTSON, J. , "Band offsets of wide-band-gap oxides and implications for future electronic devices", <u>Journal Vac. Sci. Technol. B</u> , 18(3), (2000),pp. 1785-1791	
		ROSSNAGEL, S M., et al., "Plasma-enhanced atomic layer deposition of Ta and Ti for Interconnect diffusion barriers", <u>J. Vac. Sci. & Technol. B</u> , 18, (2000),2016-2020	
		ROTONDARO, A L., et al., "Advanced CMOS Transistors with a Novel HfSiON Gate Dielectric", <u>Symposium on VLSI Technology Digest of Technical Papers</u> , (2002),148-149	
		SHANWARE, A , et al., "Reliability evaluation of HfSiON gate dielectric film with 12.8 Å SiO ₂ equivalent thickness", <u>International Electron Devices Meeting</u> , (2001),137-140	
		SNEH, OFER , "Thin film atomic layer deposition equipment for semiconductor processing", <u>Thin Solid Films</u> , vol.402, no.1-2, (January 2002),248-261	
✓		SONG, HYUN-JUNG , et al., "Atomic Layer Deposition of Ta ₂ O ₅ Films Using Ta(OC ₂ H ₅) ₅ and NH ₃ ", <u>Mat. Res. Soc. Symp. Proc.</u> , (1999),469-471	

EXAMINER

DATE CONSIDERED

3/7/05

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. † Applicant's unique citation designation number (optional) ‡ Applicant is to place a check mark here if English language Translation is attached

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 7 of 8

Attorney Docket No: 1303.026US1

DSP		SUNTOLA, T. , "Atomic Layer Epitaxy", <u>Handbook of Crystal Growth, 3: Thin Films of Epitaxy, Part B: Growth Mechanics and Dynamics</u> , Amsterdam, (1994), pp. 602-663	
		SUNTOLA, T. , "Atomic layer epitaxy", <u>Thin Solid Films</u> , 216, (1992), 84-89	
		TAKEMOTO, J. H., et al., "Microstrip Resonators and Filters Using High-TC Superconducting Thin Films on LaAlO ₃ ", <u>IEEE Transaction on Magnetics</u> , Vol. 27, No. 2, (March 1991), 2549-2552	
		TARRE, A , et al., "Comparative study of low-temperature chloride atomic-layer chemical vapor deposition of TiO ₂ and SnO ₂ ", <u>Applied Surface Science</u> , (2001), 111-116	
		TAVEL, B , et al., <u>Technical Digest of International Electron Devices Meetings 2002</u> , (2002), 429-432	
		VAN DOVER, R. B., et al., "Amorphous lanthanide-doped TiOx dielectric films", <u>Applied Physics Letters</u> , Vol. 74, No. 20, (May 17, 1999), pp. 3041-3043	
		VAN DOVER, ROBERT B., et al., "Deposition of Uniform Zr-Sn-Ti-O films by ON-Axis Reactive Sputtering", <u>IEEE Electron Device Letters</u> , Vol. 19, No. 9, (September 1998), 329-331	
		VAN DOVER, R. B., et al., "Discovery of a useful thin-film dielectric using a composition-spread approach", <u>Letters to Nature</u> , (1997), 3 pages	
		VIIROLA, H , et al., "Controlled growth of antimony-doped tin dioxide thin films by atomic layer epitaxy", <u>Thin Solid Films</u> , (1994), 127-135	
		VIIROLA, H , "Controlled growth of tin oxide thin films by atomic layer epitaxy", <u>Thin Solid Films</u> , (1994), 144-149	
		VISOKAY, M R., et al., "Application of HfSiON as a gate dielectric material", <u>Applied Physics Letters</u> , (April 2002), 3183-3185	
		VON DOVER, R B., et al., "Deposition of Uniform Zr-Sn-Ti-O Films by On-Axis Reactive Sputtering", <u>IEEE Electron Device Letters</u> , 19, (1998), 1998	
		WILK, G D., et al., "Hafnium and zirconium silicates for advanced gate dielectrics", <u>Journal of Applied Physics</u> , (January 2000), 484-492	
		WILK, G. D., et al., "High-K gate dielectrics: Current status and materials properties considerations", <u>J. Appl. Phys.</u> , vol. 89, No. 10, (May 2001), 5243-5275	
		WOLFMAN, G , et al., "Existence range, structural and dielectric properties of ZrxTiySnzO4 ceramics (x + y =2)", <u>Mat. Res. Bull.</u> , 16, (1981), 1455	
		YAMAGUCHI, TAKESHI , et al., "Band Diagram and Carrier Conduction Mechanism in ZrO ₂ /Zr-silicate/Si MIS Structure Fabricated by Pulsed-laser-ablation Deposition", <u>IEDM</u> , (2000), 19-22	
		YAMAGUCHI, TAKESHI , et al., "Study on Zr-Silicate Interfacial Layer of ZrO ₂ -MIS Structure Fabricated by Pulsed Laser Ablation Deposition Method", <u>Solid State Devices and Materials</u> , (2000), 228-229	

EXAMINER

DATE CONSIDERED

9/7/05

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

COPY

Complete if Known

Application Number	09/945535
Filing Date	August 30, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	2813
Examiner Name	Blum, David

Sheet 8 of 8

Attorney Docket No: 1303.026US1

DS07		ZHANG, H. , "Atomic Layer Deposition of High Dielectric Constant Nanolaminates", <u>Journal of The Electrochemical Society</u> , 148(4),(April, 2001),F63-F66	
↓		ZHANG, H , et al., "High permittivity thin film nanolaminates", <u>Journal of Applied Physics</u> , Vol. 87, No. 4, (February 2000),1921-1924	
↓		ZHU, W , et al., "HfO2 and HfAlO for CMOS: Thermal Stability and Current Transport", <u>IEEE International Electron Device Meeting 2001</u> , (2001),463-466	
↓		ZUCKER, O , et al., "Application of Oxygen Plasma Processing to Silicon Direct Bonding", <u>Sensors and Actuators A</u> , 36, (1993),227-231	

EXAMINER

DATE CONSIDERED

3/7/05

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. * Applicant's unique citation designation number (optional) * Applicant is to place a check mark here if English language Translation is attached